

The **THIRD INTERNATIONAL WORKSHOP ON MEASUREMENT AND COMPUTATION OF TURBULENT NONPREMIXED FLAMES** will be held on July 30 – August 1 in Boulder, Colorado just before the 27th Combustion Symposium.

**BACKGROUND, SCOPE AND OBJECTIVES:** This workshop is intended to facilitate collaboration and information exchange among experimental and computational researchers in the field of turbulent nonpremixed combustion, with an emphasis on fundamental issues of turbulence-chemistry interactions. The 1st TNF Workshop was held in Naples, Italy in July 1996, before the 26th Combustion Symposium. Objectives were to identify experimental data sets and establish guidelines for collaborative comparisons of measured and predicted results for a few well documented flames. The 2nd Workshop was held in Heppenheim, Germany in June 1997 and focused on comparison of results for hydrogen jet flames. The 3rd TNF Workshop will focus on piloted and bluff-body stabilized flames of hydrocarbon fuels.

Our overall objectives are: i) to provide an effective framework for comparison of different combustion modeling approaches, ii) to identify and correct inconsistencies or gaps in the experimental data sets, and iii) to establish a series of benchmark experiments and calculations that cover a progression in geometric and chemical kinetic complexity. We emphasize that this is not a competition among models, but rather a means of identifying areas for potential improvements in a variety of modeling approaches. This collaborative process benefits from contributions by participants having different areas of expertise, including velocity measurements, scalar measurements, turbulence modeling, chemical kinetics, reduced mechanisms, mixing models, radiation, and combustion theory. The process also benefits from the rapid time scale of communication that is afforded by the internet. Data sets, computational submodels, and some results of comparisons are being made available on the web to allow convenient access by all interested researchers.

#### **PROGRAM CO-CHAIRS:**

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**TNF WORKSHOP AGENDA:** The program will begin with an evening reception and poster session on Thursday, July 30. Posters will include comparisons of experimental and computational results for the target flames, as well as other contributed work on nonpremixed combustion. Morning and evening technical sessions will be held on Friday, July 31 and Saturday, August 1, with afternoons available for recreational activities or small group discussions. The program will include summary presentations on each of the target flames, planned and spontaneous contributions from participants, and a few invited talks on key issues. The intent is to promote open and lively discussion.

**TARGET FLAMES AND PRIMARY CONTACTS:** Three flames were selected at the 2nd TNF Workshop in Heppenheim, Germany. All three include hydrocarbon chemistry ( $\text{CH}_4$  or natural gas), and each experimental data set comprises velocity measurements and multiscalar point measurements that include CO, OH and NO. Descriptions of these flames and guidelines for calculations are (or will be) provided on the web. Modeling efforts on each flame should be coordinated with the person listed below, so that useful comparisons of measured and predicted results may be achieved.

**Piloted  $\text{CH}_4$ /Air Flame** – A new data set using the Sydney piloted burner. Robert S. Barlow, Sandia National Laboratories, Livermore, California, USA (barlow@ca.sandia.gov).

**Piloted Natural Gas Flame** – The Delft III flame. Tim Peeters, Delft University of Technology, Delft, The Netherlands (tim@duttwta.tn.tudelft.nl).

**Bluff-Body Stabilized  $\text{CH}_4/\text{H}_2$  Flame** – Includes the added challenge of flow recirculation. Assaad R. Masri, Department of Mechanical and Mechatronic Engineering, University of Sydney, Sydney, NSW, Australia (masri@mech.eng.usyd.edu.au).

Model results for each flame will be collected by the listed person and plotted along with measurements to facilitate detailed comparisons. Modelers are encouraged to submit results for more than one flame.

**OTHER TOPICS:** In addition to discussions on the three target flames, the organizers expect that there will be discussions, presentations, or posters on several related topics including: comparisons of measurements and predictions of other flames of interest; aspects of computational submodels for turbulent flow, mixing, chemistry, radiation, and turbulence-chemistry interaction; new experimental and computational results; possible target cases for swirling flames and flames in enclosures; progress in LES of reacting flows; and priorities for collaborative research.

**PRESENTATION OF POSTERS:** Posters will be a vital part of the TNF Workshop. The program will begin with a poster session, all posters will remain up for the duration of the workshop, all breaks will take place in the poster room, and the poster room will be open during the afternoons to promote small group discussions. Measured and computed results will be displayed for each of the three target flames. In addition, space will be available for contributed posters on topics in turbulent non-premixed combustion that are relevant to the workshop. Posters will be accepted on the basis of a two-page abstract, and abstracts will be included in the printed proceedings. Abstracts, posters, and presentations must be distinct from formal Symposium papers, although some results may be used in common.

**PRE-REGISTRATION:** Please submit a pre-registration form (see back page, also available on the web) as soon as possible. This will allow the organizers to arrange for appropriate facilities and determine registration fees. Depending on the level of interest, it may be necessary to limit attendance to maintain the productive atmosphere of a small workshop.

**DEADLINES:** Late forms and abstracts will be considered only if space is available.

April 15, 1998	Deadline for receipt of pre-registration information
May 1, 1998	Deadline for receipt abstracts submitted for posters
May 15, 1998	Authors notified regarding posters
May 31, 1998	Deadline for submitting computational results on the target flames

**INSTRUCTIONS FOR POSTER ABSTRACT:** (different from Symposium instructions)

- a. two pages including text, figures, and references
- b. center authors' names and affiliations under the title
- c. include the e-mail addresses, at least for the corresponding author
- d. type single spaced with Times Roman font no smaller than 10 pt
- e. even margins with printed area 6.5 x 9 inches (165 x 230 mm)
- f. send one camera-ready abstract and two copies **OR** e-mail a formatted MS-Word file to:

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**LOCATION:** The TNF Workshop will be held at the Regal Harvest House in Boulder, Colorado. This hotel has spacious 16-acre grounds that include volleyball and tennis courts. It is bordered by the University of Colorado and Boulder Creek Path. Additional information regarding accommodations and transportation will be available on the web and will be distributed with registration information.

**WEB SITE:** Information regarding the ongoing workshop process is available on the web at:

<http://www.ca.sandia.gov/tdf/Workshop.html>

This page includes information on the 1st, 2nd, and 3rd TNF Workshops, downloadable archives of experimental data, computational submodels, summary descriptions of selected flames, and links to related web sites. This web site will be updated as regularly as possible with technical and logistical information.

**ORGANIZING COMMITTEE:**

R. Barlow, J.-Y. Chen, R. Bilger, E. Hassel, J. Janicka, A. Masri, T. Peeters, N. Peters, S. Pope

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